

PARTNER UPDATE

Weatherization and Intergovernmental Program

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Kentucky Partnership Reaches Out to North Carolina Peers

Rebuild Kentucky is serious about educating school officials about high-performance schools, even if it means sending them on a field trip across state lines.

“In Kentucky, there is a strong, driving force to do everything we can to improve our schools,” explains Greg Guess, program manager, Kentucky Division of Energy.

The partnership – with the help of Kentucky NEED (National Energy Education Development Project), Rebuild America program representative Charles Young, and the North Carolina Department of Administration’s State Energy Office – organized a 10-person trip to North Carolina so that Kentucky school officials could see high-performance schools in use.

Guess says many school officials are receptive to the idea of energy-efficient schools but still need some convincing to

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Tennessee Prison System Gets Tough on Energy Waste



States can find savings in some unusual places, including behind bars.

Tennessee is becoming a leader in energy efficiency for correctional institutions, one reason why their recent energy technical seminar was well attended despite icy conditions that paralyzed the region. The Tennessee Department of Correction (TDOC) is working to reduce energy and water costs in the state’s prison system through such simple steps as weather-sealing windows and more complex upgrades including geothermal installations.

In 1998, TDOC saved \$1.9 million in energy costs, significant savings for a system that now holds 18,000 incarcerated persons at a cost to the state of \$47.63 per day for each inmate. TDOC expects additional savings through more energy-efficiency upgrades and follows ENERGY STAR® guidelines.

Energy-efficiency projects at the Northeast Correctional Complex (NECX) in Mountain City have resulted in considerable cost savings. Improvements included a comprehensive lighting retrofit – in which eight-foot T-12 fluorescent lamps were replaced with more efficient four-foot T-8 fixtures – and operational changes to the heating, ventilation and air conditioning (HVAC) system.

Because the complex sits at an elevation of several thousand feet, there can be a great difference between the daytime high temperature and the nighttime low. To reduce energy costs, NECX established heating and cooling seasons for HVAC operations. This prevents the facility from being air-conditioned and heated on the same day.

According to facilities director Ronnie Henson, inmates previously laundered their own clothes, using 30 washers and dryers in the individual housing units. To reduce water and energy use, NECX centralized the

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Partnership Reaches Out

build one. He feels the best way to get them motivated to build high-performance facilities is to show them these schools.

Superintendents, private-sector architects, a school board member, and an architect from the Kentucky Department of Education participated in the trip. The U. S. Department of Energy Atlanta Regional Office funded travel expenses for two participants through its training and technical assistance program.

The first stop on the tour was Wake County, one of the fastest-growing counties in North Carolina. Jeri Preddy and Christina Larkins, energy educators with the Wake County Public School System, spoke about the school district's EnergySavers program, which is saving \$400,000 in energy costs each year.

Although Wake County is building three to four new schools annually, the school district strives for high-performance facilities. Air-conditioning expenses at one Wake County school operating all year are 34 to 38 percent less than a conventionally built school operating for only nine months.

The use of natural light is a key element of the school district's plans for renovating and constructing schools. Studies cited by Innovative Design – an architecture firm that has worked with Wake County Public Schools – demonstrate a correlation between natural light and better student performance in math and science.

Mike Nicklas of Innovative Design continued the program with a presentation on sustainable schools. He then led a tour of The New School: Montessori Center for Children, in Apex. The school is filled with natural light. Cloth baffles

After the tour, many of the participants who were on the fence about high-performance schools were convinced to try it.

diffuse the daylight to ensure uniform lighting conditions.

The group also visited Orange County to tour R.D. & Euzelle P. Smith Middle School in Chapel Hill. The school, designed by Corley Redfoot Zack Inc. in partnership with Innovative Design, is a model of sustainability. Ken Redfoot, architect with Corley Redfoot Zack, explained the innovative features, including abundant use of natural light, a rainwater collection system for recycling water, and a solar hot-water heating system for the kitchen. A photovoltaic array powers the lights above the school bus loading area while also serving as a teaching tool.



Above, participants in tour see how daylight and fluorescent light are used in Smith Middle School media center.

Kentuckians Mike Fallin, John Bridges and Greg Guess tour Smith Middle School.

After the tour, many of the participants who were on the fence about high-performance schools were convinced to try it. Guess credits the change to the participants' conversations with the architects and the buildings' occupants. "Peer-to-peer exchange is key," he says.

Jyoti Sharma, director of facility planning for the Wake County Public School System, and Ray Massey, the system's associate superintendent for auxiliary services, provided tips for marketing high-performance schools for the architects and school officials to use upon returning to Kentucky.

As part of the follow-up to the tour, Rebuild Kentucky is working with the Sustainable Buildings Industry Council to present a workshop on high-performance school buildings April 30 in Georgetown, KY. The workshop will target school districts, along with the architectural and mechanical design communities. If the response is positive, they may organize more workshops or plan another field trip.

Rebuild Kentucky's goal is to convince the state's school districts to build showcase high-performance schools. If the districts do so, Rebuild Kentucky and Rebuild America can provide assistance in the design process, including technical help, assistance with charettes, and plan review.

For more information contact Greg Guess at (502) 564-7192 or gregory.guess@mail.state.ky.us.

Commissioning Proofs Buildings From Woes

Despite being largely misunderstood and underutilized, building commissioning has emerged as a valuable tool for ensuring optimum performance of newly constructed or renovated buildings.

Many Rebuild America community partnerships are employing the services of “commissioning authorities” to help design and run efficient buildings. Commissioning works with energy efficiency to assure more comfortable buildings that incur lower energy costs.

“Commissioning is a great tool for owners of both new and existing buildings who have issues such as energy, comfort, life safety, and other operational problems,” says Toby Benson of the Montana Department of Environmental Quality.

While complicated in execution – it involves the complex elements of a building’s systems – it is quite simple in theory. Its purpose is to ensure that the building will run smoothly, comfortably and efficiently.

Commissioning is the process of testing the performance of a building’s interactive systems – heating, ventilation and air conditioning units, controls, lighting, etc. – and, where applicable, tweaking them to perform as designed.

If there is a downside, it is that commissioning can raise the construction costs of a building by as much as 3 percent. But commissioning is an investment. Buildings that do not undergo commissioning incur 15 to 20 percent higher operation and maintenance costs than those that do, on average. Pay more now, save much more later.

As demonstrated by problems with comfort that were discovered at the East Valley Middle School in East Helena, MT, commissioning is often overlooked when a construction project is finished. It was only as a result of later commissioning – in response to complaints – that the school’s problems were identified and fixed. (Partner Update, November-December 2002, page 5.) Ignoring commissioning can prove costly as energy bills skyrocket and those who work or reside in the building are left uncomfortable.

Many Rebuild America Business Partners, such as 2RW Consultants Inc. and Merit Energy Systems (a division of Merit Engineering Inc.), offer commissioning services.

At a Rebuild America Peer Exchange in November, Robert Somers of 2RW stressed that commissioning applies to all building systems.

Rebuild America participants can request technical assistance through their designated customer service representative.

View From DC

by Daniel Sze

Rebuild America leadership is active on many fronts, taking measure of where the program is and positioning it for the future. This year the program will put more emphasis on two critical sectors where the need is great and the potential strong for energy-saving initiatives – the universities and colleges and the public housing sectors.

We are similarly examining our Business Partner and Strategic Partner components to see how we can add value to their participation in the program and determine how the collective resources of the private sector and professional networks of trade associations can best be used to advance energy-efficiency efforts. We continue to have great confidence in the private sector and in trade associations as effective vehicles for sharing information, expertise and expanding the reach of Rebuild America.

It is especially important to build those connections at a time when budgets are strained. For Fiscal Year 2004, the budget proposal to Congress for Rebuild America is less than last year’s request. This is so that the government can boost important new programs to make hydrogen the fuel of the future. Our belt-tightening makes our partners all the more important in order to leverage program assets as much as possible.

There is no doubt that energy efficiency retains support at the federal level. President Bush put a clear emphasis on it when he delivered his State of the Union message. He especially connected energy issues with environmental protection – a reminder of the connections between a great many local, state and federal efforts to clean the air and cut energy bills at the same time.

We also can rededicate ourselves to doing a more comprehensive job of recording our accomplishments – money saved, energy saved and pollution prevented. Those are the measurable results that justify this work.

We continue to build interconnections not only with private-sector partners and hundreds of communities but with other federal programs. For example, the Department of Energy and the Department of Housing and Urban Development have agreed to renew a three-year inter-agency agreement to use Rebuild America partnerships as a mechanism for advancing energy-efficiency improvements in public housing.

All signs point to the effectiveness of teamwork.

Dan Sze is National Program Manager of Rebuild America. Your comments are always welcome at danielsze@rebuild.org.

Ohio Keeps Public Housing Warm at Less Cost With Help of Three Efficiency Projects

In the Ohio cities of Cincinnati, Portsmouth and Canton, public housing is wasting less energy, water and money while keeping residents more comfortable these days thanks to extensive retrofits under performance contracts.

Given the chilliness of this winter in the eastern half of the United States, the projects are success stories to warm the hearts of housing officials and residents alike. But more than that, there are lessons to be learned on the procedural details of how to put together such contracts and achieve results.

The projects, summarized late last year at the Rebuild America Midwest Peer Exchange in Indianapolis, are well past their installation phases and are producing guaranteed savings year by year. In brief:

- The Portsmouth Metropolitan Housing Authority made \$3.6 million in upgrades, involving 851,047 square feet, 140 buildings and 887 units;
- The Stark Metropolitan Housing Authority (for Stark County, including the city of Canton) made \$6.4 million in improvements, involving 821,169 square feet;
- The Cincinnati Metropolitan Housing Authority made \$7.2 million in upgrades, involving 3,988,277 square feet and more than 4,600 units.

Because the improvements were made through performance contracts, they involved no capital expense by the housing authorities. Under performance contracts, the contractor makes the improvements and covers the cost through the achieved savings. In these cases, savings came

not only through restrained energy consumption – the primary goal – but also through reduced water use. Savings are projected and guaranteed by the contracting company.

Complications in the public-housing sector come from several areas. U.S. Housing and Urban Development (HUD) regulations make financing tricky, and housing tenants often may not see an incentive for energy-saving behavior when government agencies are covering costs. But Ohio effectively worked its way through these complications.

Following are some key points that can be drawn from the results of these projects and the comments of Ohio officials.

A typical timeline:

- RFP (request for proposals) process: 1-2 months
- Energy audit: 3-4 months
- HUD approval process: 1-3 months
- Energy conservation work: 6-18 months
- Term of performance contract: 8-12 years

Companies must bid on an energy audit and negotiate its exact terms. A quick way to weed out some bidding

Vestar Inc. Financial Cash Flow Analysis					
Project Cost: \$7,205,255		Rate of Financing: 5.1%		Terms of Financing: 12 Years	
				Construction Period: 10 months	
Year	Total Projected Savings	Payment to Lessor	Annual Monitoring Fee	% of Net Savings to CMHA	CMHA Savings Dollars
1	\$889,878	\$843,750	\$32,551	100%	\$13,577
2	\$889,878	\$843,750	\$32,551	100%	\$13,577
3	\$889,878	\$843,750	\$32,551	100%	\$13,577
4	\$889,878	\$843,750	\$32,551	100%	\$13,577
5	\$889,878	\$843,750	\$32,551	100%	\$13,577
6	\$889,878	\$843,750	\$32,551	100%	\$13,577
7	\$889,878	\$843,750	\$32,551	100%	\$13,577
8	\$889,878	\$843,750	\$32,551	100%	\$13,577
9	\$889,878	\$843,750	\$32,551	100%	\$13,577
10	\$889,878	\$843,750	\$32,551	100%	\$13,577
11	\$889,878	\$843,750	\$32,551	100%	\$13,577
12	\$889,878	\$843,750	\$32,551	100%	\$13,577
Totals	\$10,678,536	\$10,125,000	\$390,612	100%	\$162,924

companies is to cut from the bid list those that propose high-cost energy audits. After an audit is conducted, a competent projection can be made on potential energy savings, and typically the company that did the audit wins the contract to carry out the energy-savings project.

Savings may exceed projections. It is up to the contracting company and the client – in these cases the public housing authority, or PHA – to negotiate on who will keep the additional savings.

In the Portsmouth case, George Horsley of the housing authority says his organization negotiated a contract that allows the PHA to keep all savings, including excess over the guaranteed savings. That eliminates the energy service contractor's incentive to exaggerate savings in order to keep more money, he says.

Every 12 months, the savings are audited and reconciled. If there are not enough savings, the contractor writes a check to the PHA to cover the shortfall.

Savings can come in several ways. In the Portsmouth case, contractor CMS Viron Energy Services not only installed equipment that would consume less power but negotiated a new gas contract.

In the case of the Cincinnati Metropolitan Housing Authority upgrade, it was Vestar Inc. – a unit of Cinergy Corp. – that won the contract. Drawing lessons from that project, Vestar lists these success factors:

- Notify local and regional HUD offices;
- Early involvement by public housing authority board;
- Solicit financing in parallel to energy audit and project development;
- Define board's approval points and get on board's calendar;
- Keep regional HUD office informed;
- Determine incentive methodology;
- Complete the energy audit quickly.

HUD regulations can pose challenges, but state and local officials have been finding ways to deal with those issues. HUD is a Rebuild America Strategic Partner.

CMS Viron and Vestar are Rebuild America Business Partners, and the Portsmouth Metropolitan Housing Authority and Stark Metropolitan Housing Authority are Rebuild America community partnerships.

A PowerPoint presentation on the Vestar energy conservation program for the Cincinnati Metropolitan Housing Authority can be viewed on the Rebuild America Web site by clicking on Events, then the Chicago Regional Peer Forum 2002, then the presentation.

For other information on Ohio Rebuild America programs, contact Emmanuel (Manny) Anunike of the Ohio Department of Development, eanunike@odod.state.oh.us.



The EnergySmart Schools classroom on display at ASBO's annual conference in Phoenix, AZ.

Model Classroom Teaches Savings

Rebuild America displayed a model classroom at the 88th Annual Meeting & Exhibits of the Association of School Business Officials International (ASBO). It illustrated the benefits of an EnergySmart school.

The 3,000-pound mock-up, part of an EnergySmart Schools exhibit, featured high-performance windows, skylights, T-5 fluorescent lighting with occupancy sensors, and an ENERGY STAR® cool roof.

Information cards throughout the exhibit described the energy-saving technologies.

The features displayed in the exhibit were particularly relevant to the nearly 2,000 business officials involved with school operations. Studies indicate that K-12 schools spend 25 to 30 percent more on energy costs than necessary.

Rebuild America Business Partners Lithonia Lighting, Sarnafil, TRACO, Novitas and U.S. Daylighting L.L.C. (formerly Universal Natural Light) incorporated products in the structure to demonstrate energy saving. ENERGY STAR® donated energy-smart computers for the exhibit. Other Business Partners participating in the EnergySmart Schools Exhibit included Bayview Technology Group, Insulated Component Structures, McQuay International, Powersmiths International and Trane Company.

Modular Technology Inc. designed and constructed the 94-square-foot classroom in its factory in Phoenix, AZ. ASBO, a Rebuild America Strategic Partner, donated 800 square feet of exhibit space for the EnergySmart Schools display.

The model classroom was recently displayed at the annual conference of the Council for Educational Facility Planners International (CEFPI) in Scottsdale, AZ. CEFPI, a Rebuild America Strategic Partner, also donated space.

Rebuild America participants interested in displaying this model can contact their designated customer service representative with their requests.

Wisconsin Works to Transform Markets for Equipment, Design and Management

The Wisconsin Department of Administration (DOA) has set itself the goal of creating vibrant markets for energy-efficient goods and services. As part of the contracts it awards for building upgrades, the state tracks and promotes the wider impacts of its programs, with the long-term intention of pushing and pulling markets into self-sustaining change.

“Traditional approaches for mandatory demand-side management by utilities were measured strictly by how many therms and kilowatt-hours were saved annually,” says Terry Pease, Rebuild America program representative for Wisconsin. “Few efforts were being made to create a sustainable marketplace for consumers, so this program is really a fresh way to approach and measure long-term changes.”

The approach involves systematic recruitment of manufacturing, retailing and service companies as allies. And it requires tracking – a key to measuring accomplishment.

State officials have developed a series of metrics for tracking market impacts. Contractors must produce the metrics and work toward the market-changing objectives.

“At some point, when the market share for energy-efficient products and services reaches a sustainable plateau, we will have accomplished our goal.”

Each sector has specific market indicators to achieve in a contract period.

Pease presented the measurement tools of the state’s Focus on Energy programs to Rebuild America program participants last fall in Indianapolis at the Midwest Regional Peer Exchange.

A baseline of current market conditions had to be developed by assessing each sector’s level of involvement with energy efficiency. This entailed telephone surveys, questionnaires and face-to-face interviews with key players in each sector. The players may be HVAC (heating, ventilation and air conditioning) contractors, electricians, energy service contractors, or manufacturers of energy-related products.

Baseline research doesn’t stop there, however. Decision-makers from schools, private building owners, developers and lenders were also surveyed to develop a better

understanding of the awareness and steps they were taking toward making energy-efficiency decisions.

This information set a ground floor above which goals could be set. Intervention from the Focus on Energy programs will then be measured periodically to assess market changes and determine the most successful activities that have influenced each sector’s behavior.

Key indicators are expressed in percentages of market change. Some programs are measured by the increase in the number of companies developing an energy-efficient procurement policy, while others may be measured by how many architects have adopted energy-efficient designs for high-performance buildings.

A motor manufacturer can be measured by increases in sales of high-efficiency motors as compared to business as usual. Increases in the number of projects reported by trade allies is another indicator.

“At some point in the future, when the market share for energy-efficient products and services reaches a sustainable plateau, we will have accomplished our goal,” Pease says. “This is definitely a long-term yet cost-effective approach.”

The DOA hopes the energy-efficiency markets become more regional to bring down the costs of energy-efficient products and services.

“Changing the Midwestern markets is a big chore and will take the efforts of our region to accomplish a competitive

marketplace,” Pease says.

For now, milestones are less noteworthy than the fact that the four-year-old program has been launched and is growing – in some cases, growing rapidly.

“In our schools program, the growth in recent years has been tremendous,” Pease says.

For an example of a Wisconsin matrix drawn up to track market changes, see the chart at right. It is specific to schools but parallel to the sort of matrix drawn up for other sectors. Wisconsin also is trying to track market impacts in the goods and services and operations of government buildings, commercial buildings large and small, industrial facilities, rural communities, agricultural technologies and the processing plants that treat water and wastewater.

For more information related to Focus on Energy, please visit www.focusonenergy.com or call Terry Pease at (608) 267-7971.



Wisconsin Focus on Energy, Major Markets: Schools

Second Contract Period

Programs/Activities	Market Barriers/Goals/Metrics/Milestones			
	Critical Barriers	Critical Goals	Critical Metrics	Critical Milestones
Conduct statewide energy use survey for each segment, target and implement services to top 25% of highest energy using buildings in each sector.	Energy cost management is not a priority to decisionmakers (school boards and district administrators).	10% increase in the number of school districts statewide that adopt EE policies and practices.	Measure any increase in the number of school districts statewide that adopt EE policies and practices compared to a market baseline.	By end of contract year two
Use ENERGY STAR® benchmarking tool with statewide energy use survey to label facilities and increase awareness of decision-maker.	Energy cost management is not a priority to decisionmakers (school boards and district administrators).	Increase number of educational decision-makers statewide that implement EE projects without Focus involvement.	Measure any increase in the number of educational decisionmakers statewide that implement EE projects without Focus involvement compared to a market baseline.	By end of contract year two
Provide technical training sessions statewide for building operators.	Energy cost management is not a priority to decisionmakers (school boards and district administrators).	Increase the number of EE school projects implemented by building operators statewide based on recommendations from DPI, Commerce, WASDA, WASBO, and WASB.	Measure any increase in the number of EE school projects implemented by building operators statewide based on recommendations from DPI, Commerce, WASDA, WASBO, WASB, compared to market baseline.	By end of contract year two
Empower DPI, Commerce, WASDA, WASBO and WASB as advocates for energy efficiency in schools by enlisting them as program delivery agents.	Energy cost management is not a priority to decisionmakers (school boards and district administrators).	Increase the number of EE school projects statewide that are implemented without any financial incentives from Focus.	Measure any increase the number of EE school projects statewide that are implemented without any financial incentives from Focus compared to a market baseline.	By end of contract year two
Provide allies, A & E firms, lenders, and organizations training, EE materials and media, curricular support, technical assistance, and EE sales support package.	Allies (products/service providers), A & E firms, lenders, and other organizations see limited value in selling/offering EE products to their customers.	Increase the number of new schools stateside that are built to high performance standards without Focus involvement.	Measure any increase statewide in the number of new schools built to high performance standards without Focus involvement, compared to market baseline.	By end of contract year two
Provide allies, A & E firms, lenders, and organizations training, EE materials and media, curricular support, technical assistance, and EE sales support package.	Allies (products/service providers), A & E firms, lenders, and other organizations see limited value in selling/offering EE products to their customers.	Increase in number of product/service providers statewide that invest in inventory, training and capital equipment for EE products and services offered to schools.	Measure any increase in the number of product/service providers statewide that invest in inventory, training and capital equipment for EE products and services offered to schools, compared to market baseline.	By end of contract year two

TECHNOLOGY:

Oak Ridge Lab Helps Develop Steel-Frame Walls

Researchers at Oak Ridge National Laboratory (ORNL) have figured out how to make steel-framed walls that are comparable to wood in thermal efficiency and cost.

Large buildings already have steel frames, of course. But for home renovators and builders, wood framing overwhelmingly dominates the market. Now steel-framed walls can provide their benefits of strength, safety, durability and reduced environmental impact while matching the energy performance of wood-framed construction for multifamily and single-family housing and many moderate-size commercial buildings.

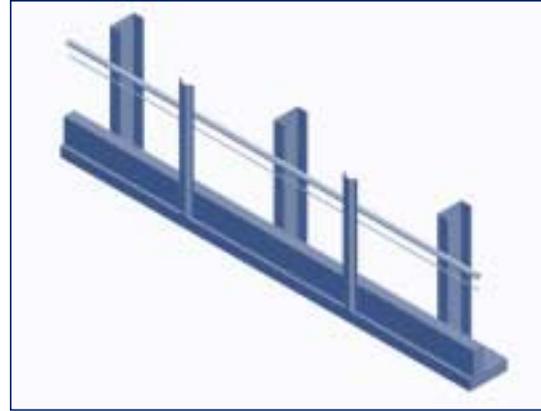
In the ORNL Building Technology Center, Jan Kosny explains that he and fellow researchers have come up with more than one design that can allow steel framing to be substituted for wood in walls.

For one of their designs with patent pending – a design incorporating a novel shape for the steel stud – they are looking for an industrial partner to take the system into development. A second design has been put in the public domain and can be adopted by the general public with conventional building supplies already widely available.

The energy problem with conventional steel stud walls is that thermal bridges created by the steel components reduce their thermal performance by up to 55 percent. Steel is a good conductor of energy, potentially allowing increased winter heat losses and summer heat gains.

During 2001-02, Kosny and colleagues tested both of their new steel-frame designs against wood 2x6 walls. Steel and wood walls both had fiberglass insulation. The resulting difference in energy efficiency was negligible, he says.

The Steel Framing Alliance, an industry group, also reports life-cycle energy savings can be anticipated from steel-frame walls due to the relative air tightness of a steel building.



Steel and wood are combined in ORNL novel wall.

ORNL steel-frame walls are 10 to 15 percent more expensive than wood-frame walls, the national lab's researchers estimated. But there are other measures by which ORNL steel technologies have cost advantages over the wood framing. The ORNL steel framing comes with special channels to allow for wiring and piping, so that holes do not have to be drilled – allowing a savings on labor during construction.

Savings also can come from the steel being resistant to temperature, humidity, termites, rotting, splitting, cracking and warping. There is less variability in steel materials than in wood, which means more reliability in steel materials and less waste from material discarded during construction.

Structural steel installed in buildings is almost 100 percent recyclable, and it does not involve chopping down trees, a politically sensitive subject. It lasts longer than wood, making it come closer to the ideal of "sustainability" in construction – longer life equating to less resource demand for replacement units. It increases fire safety, and mold does not grow on it.

The various advantages of steel counterbalance or even beat the initial cost advantage of wood, Kosny says.

Material advantages and cost are not the only factors that must be considered, however. Market inertia is a concern. Builders, designers and do-it-yourself homeowners also can be resistant to anything new. "People often are afraid of encountering problems they can't solve," Kosny says.

Both of ORNL's steel-wall designs were devised in consultation with the American Iron and Steel Institute, Steel Framing Alliance, and several steel-forming companies from North America and Scandinavia. The Steel Framing Alliance, an industry group, was created by the American Iron and Steel Institute in 1998 to accelerate the use of light-gauge steel framing in construction.

More information on the Oak Ridge technologies can be obtained by contacting Marty Goolsby, (865) 574-4166. For news and background information from industry, visit the Steel Framing Alliance at www.steelframingalliance.com.

New Partnerships

Town of Blacksburg, VA
Mammoth Cave National Park, KY
Tucson Unified School District, AZ
King County Housing Authority, WA
Alexandria County Day School, VA
Edmonson County Public Schools, NC



A control panel for a heat pump.

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Prison System

operation, and one TDOC employee now supervises the operation. The current laundry uses four washers and 15 dryers. In addition to saving on utility costs, maintenance expenses dropped dramatically, largely because the inmates are no longer responsible for washing and drying.

Henson also notes that they are trying to change people's behavior by attaching signs on light switches reminding users to turn off the lights if a room is unoccupied.

In 1999, NECX saved \$250,000 in energy costs. The facility uses less energy today than before the energy-efficiency upgrades were implemented, even though 340 more inmates have been added.

Henson credits Rebuild America with helping NECX get started on the road to energy efficiency. He and his staff attended Rebuild America technical seminars which helped them identify ways to save energy.

Across the state, in Tiptonville, the Northwest Correctional Complex (NWCX) installed a pilot geothermal system to help heat and cool a building housing 48 inmates. The Tennessee Valley Authority (TVA) – the largest U.S. public power company – provided funding to hire an engineer to design the system. A team of professors and students at the University of Tennessee-Martin (UTM) developed specifications for the instrumentation. The students designed, installed and tested the controls – some real-world experience for the undergraduate engineering majors.

The project is unique in that the system can be directly compared to an identical building nearby that uses the same heat pumps but is connected to a central loop system instead of the geothermal system. A third identical building, which uses the old heating system, is also being used as a control group.

For the next two years, the UTM students will collect the data through a Web-based monitoring system. They are also

developing software to automate the collection system and analyze the results. The students, along with Drs. Robert LeMaster and Douglas Sterrett, will present the findings at the American Society for Engineering Education's annual conference June 22-25 in Nashville. "In the end, we want to know without question which one of these systems is the most economically viable approach for us," explains Mark Watson, NWCX procurement officer.

The Northwest Correctional Complex's efforts go beyond the geothermal project to include water conservation. Timing devices installed on latrines, water closets and showers shut off the stream of water after a specified amount of time. TDOC estimates that the electronic controls have reduced water use by 50 percent while also lowering maintenance costs. TDOC also is involved in the testing of alternative systems for treating cooling tower water.

TDOC is also helping others learn how to save energy. In December, TDOC successfully presented an energy technical seminar in Pikeville. Attendees gained insight into substantial energy-saving opportunities in this often-

"In the end, we want to know without question which one of these systems is the most economically viable approach for us."

overlooked segment of government facilities.

Nine Rebuild America Business Partners participated in the program, including Lithonia Lighting, Earth Protection Services, Water & Energy Savings Corporation, Cutler-Hammer, McQuay International, Siemens, EnLink GeoEnergy Services, Sarnafil and Johnson Controls. TVA and Johnson Controls sponsored the conference expenses.

With the success of the program, the Department of Correction may organize another program this fall.

The program was particularly relevant for those attendees whose states face budget deficits. Some states are going so far as releasing non-violent offenders to help balance their budgets. With Tennessee's proven track record of reducing energy use in correctional facilities, it is quickly becoming a model for other states looking to reduce costs.

For more information contact Customer Service Representative Charles Young at (252) 459-6300, or Atlanta Regional Team Leader Greg Andrews at (404) 562-0573.

STRATEGIC PARTNER:

APPA Helps Cut Electric Utility Bills

While researchers in laboratories of the U.S. Department of Energy study ways to increase energy efficiency, the American Public Power Association (APPA) is working toward the same goal with its own R&D effort. The latest result of that program is a guide on energy efficiency for small businesses, just on the verge of being published.

APPA, a Strategic Partner of Rebuild America, has other partners, too. For the new guide coming out for small businesses, the power association teamed up with yet another Rebuild America Strategic Partner – the Association of Small Business Development Centers. Most often, APPA teams with one of its own member utilities.

More than 2,000 municipally owned utilities form APPA. Partly because they are public utilities, not corporations with profits to worry about, they work to help their communities – their owners – save money through efficiency.

Another reason for their interest in efficiency is their wariness of being forced to dip deeply into wholesale markets when electrical power demand surges. A utility can take a financial hit when buying additional power supplies, which do not always come cheap.

“A lot of our projects in the end do help with demand-side management,” says Michele Ghosh, APPA’s administrator for its Demonstration of Energy-Efficient Developments (DEED) program.

Created in 1980, DEED sponsors activities that promote energy innovation, including efficiency projects. Here is a sampling of DEED projects, almost always developed with a member utility taking the lead:

- In Kentucky, the Glasgow Electric Plant Board hopes to cut maintenance costs for street lighting by developing controls that will transmit streams of information from photo cell units to a centralized data base.
- In Texas, Cities Public Service is investigating grid connection issues and performance capabilities of a combined heat and power system that would be installed in a typical supermarket to save energy and provide backup power.
- In Vermont, the Burlington Electric Department wants to document the process of creating and sustaining a Green Schools program at a large urban high school.

APPA utilities serve about 15 percent of the U.S. public. To learn more of DEED projects, visit its Web site at www.appanet.org/DEED/projects/projects.cfm.

Upcoming Events

March

11-12 Measurement & Verification Workshop, Middle Tennessee State University, Murfreesboro, TN. Contact Linda Hardyman at 615-904-8096 or email lhardymo@mtsu.edu.

12-15 Building Energy 2003 Conference, Boston Park Plaza Hotel, Boston, MA and Massachusetts Institute of Technology, Cambridge, MA. Call 413-774-6051 or email nesea@nesea.org.

13 Rebuild America Energy Saving Technology Seminar, Southern California Edison Customer Technology Center, Irwindale, CA. Visit www.rebuild.org/events/eventdetails.asp?NewsID=1478

17-19 National Association of Housing and Redevelopment Officials 2003 Legislative Conference, JW Marriott Hotel, Washington, DC. Visit the Rebuild America Web site, www.nahro.org/conferences/legoverview.html.

24-26 National Center for Photovoltaics Solar Program Review Meeting – 2003, Marriott City Center, Denver, CO. Contact Ivilina Thornton at 303-275-3781 or email ivilina_thornton@nrel.gov.

April

2-3 Association of Energy Engineers Globalcon 2003 Conference & Expo, Hynes Convention Center, Boston, MA. Contact Ruth Marie at 770-447-5083 or email info@aeecenter.org.

Rebuild America Progress Calculator

Number of Partnerships:

503

Total Number of Committed or Completed Square Feet:

1,099,242,538

as of February 7, 2003

Snap Shot: Bill Mixon

Vital Statistics

About four year ago, Bill moved to Watts Bar Lake – about halfway between Knoxville and Chattanooga, TN – after living in Oak Ridge, TN. Bill lives with his wife, Louise, a real estate agent, who is active in Altrusa, the Rotary Club, the local Chamber of Commerce and her church choir. Bill and Louise have two sons and two grandsons, ages 11 and 15, who live in Knoxville. They have no pets, Bill notes, unless you count the herd of uninvited white-tail deer that frequent their yard to taste the flowers and shrubs.

How long have you been working with the Rebuild America program?

I'm a charter member. Work began in the fall of 1993 with the U.S. Department of Energy (DOE) and other participants to develop implementation plans for Rebuild America.

How did you get into this line of work?

In 1974, while at Oak Ridge National Laboratory (ORNL), I took the opportunity of managing a U.S. Department of Housing and Urban Development (HUD) program to develop and assess the concept of stand-alone, integrated community utility systems for conservation of energy and water and minimization of liquid and solid waste. This program developed unique expertise in my group for estimating demands and managing resources for all utility services, and illustrated the large potential for reduced consumption of purchased energy and water and environmental impacts.

We realized the much greater potential for energy savings in existing buildings and developed an Existing Buildings Research Program, with funding from DOE, the Air Force, Army, HUD and two utilities, which I managed at ORNL. After all, there were 100 million existing buildings and only about one million new buildings built each year. Highlights included development of the national energy audit (NEAT) and other technical improvements for the DOE Weatherization Assistance Program that increased energy savings from 10 percent to 25 percent at the same cost; development of guidelines and procedures for weatherization of military family housing; implementation of a DOE-HUD initiative for public housing; field monitoring to determine the actual energy savings of a wide range of



Bill Mixon is an assistance coordinator with Rebuild America's Products and Services Team.

retrofit measures in residential and commercial buildings; energy benchmarking for Asia-Pacific Economic Cooperation; pilot projects for state buildings; and an initial proposal and four-month assignment at DOE headquarters that helped get Rebuild America started.

What do you find most rewarding about your work?

That the program has approval of partnerships and is making a difference in the way that buildings are designed and retrofitted that may be self-sustaining. It's also rewarding when expertise within the National Labs and Business Partners is matched with partnership needs to improve the implementation and benefits of building projects.

What is your favorite thing to do in eastern Tennessee?

My favorite things include social and sports activities with long-time friends, quality time with the grandsons – watching their soccer games, taking trips to the mall and Dollywood®, and hosting overnight birthday parties – and enjoying the ever-changing beauty of the lakes and mountains, along with winding down with a spectacular sunset from our west deck.

What do you like to do in your spare time?

I like to play tennis, cruise on the deck boat or jet ski, play bridge, fish for crappie or bream (with fly rod), snow ski, travel, and try to keep all the toys in working condition. Goals for next summer are to get back on the wind surfer and Hobie Cat (a small, one-person fishing boat).

What is your dream vacation?

Life is a beach. I'd like to spend a week each at some of the beautiful beaches we have seen during cruises in the Caribbean, but a slow wine trip by barge through France or a return to Venice and southern Italy also sound like good dream vacations.

A Strong Energy Portfolio for a Strong America

Energy efficiency and clean, renewable energy will mean a stronger economy, a cleaner environment, and greater energy independence for America. By investing in technology breakthroughs today, our nation can look forward to a more resilient economy and secure future.

Far-reaching technology changes will be essential to America's energy future. Working with a wide array of state, community, industry, and university partners, the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy invests in a portfolio of energy technologies that will:

- Conserve energy in the residential, commercial, industrial, government, and transportation sectors
- Increase and diversify energy supply, with a focus on renewable domestic sources
- Upgrade our national energy infrastructure
- Facilitate the emergence of hydrogen technologies as a vital new "energy carrier."

The Opportunities

Biomass Program

Using domestic, plant-derived resources to meet our fuel, power, and chemical needs

Building Technologies Program

Homes, schools, and businesses that use less energy, cost less to operate, and ultimately, generate as much power as they use

Distributed Energy & Electric Reliability Program

A more reliable energy infrastructure and reduced need for new power plants

Federal Energy Management Program

Leading by example, saving energy and taxpayer dollars in federal facilities

FreedomCAR & Vehicle Technologies Program

Less dependence on foreign oil, and eventual transition to an emissions-free, petroleum-free vehicle

Geothermal Technologies Program

Tapping the earth's energy to meet our heat and power needs

Hydrogen, Fuel Cells & Infrastructure Technologies Program

Paving the way toward a hydrogen economy and net-zero carbon energy future

Industrial Technologies Program

Boosting the productivity and competitiveness of U.S. industry through improvements in energy and environmental performance

Solar Energy Technology Program

Utilizing the sun's natural energy to generate electricity and provide water and space heating

Weatherization & Intergovernmental Program

Accelerating the use of today's best energy-efficient and renewable technologies in homes, communities, and businesses

Wind & Hydropower Technologies Program

Harnessing America's abundant natural resources for clean power generation

To learn more, visit www.eere.energy.gov



U.S. Department of Energy
**Energy Efficiency
and Renewable Energy**



Rebuild America is a network of partnerships – focused on communities – that save money by saving energy. These voluntary

partnerships choose to improve the quality of life in their communities through energy efficiency. Rebuild America supports them with customized assistance backed by technical and business experts and resources.

Published bimonthly by the U.S. Department of Energy, Partner Update now incorporates other news about energy-efficient initiatives of the Office of Energy Efficiency and Renewable Energy.



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Marketing and Communications Rebuild America Help Line 202-466-7868

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